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ABSTRACT

A study examined the nature and the relative incidence of different forms of underemployment and how and under what conditions underemployment of older workers differed from that of younger workers. Data from May 1979, May 1988, and April 1993 Current Population Surveys (CPSs) for workers aged 50-64 were used. Two categories of underemployed workers were identified. Type I underemployment, which could be directly estimated from CPS data, referred to workers who wanted full-time work but could find only part-time employment. Determined by multivariate analysis, Type II underemployment encompassed full- and part-time workers employed at jobs below their education and skill levels. It was defined by comparing each worker's actual wages to the expected wages for a worker with similar education, demographic characteristics, industry and occupation, region, and size of firm. CPS data indicated Type I underemployment had been steadily rising over time. Type I underemployed were found to be an extremely disadvantaged group in terms of pension and health insurance coverage; Type II underemployed were also disadvantaged. Nearly 400,000 workers between the ages of 50-64 were estimated to be Type I underemployed; the estimated number of Type II underemployed was much larger--7.2 million. Single people, females, minorities, and persons with less education tended to have higher underemployment rates. The magnitude of Type II underemployment highlighted the need for further work to refine these estimates. (Contains 10 references.) (YLB)

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Underemployment and the Older Worker: How Big a Problem?

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The Public Policy Institute, formed in 1985, is part of the Division of Legislation and Public Policy of the American Association of Retired Persons. One of the missions of the Institute is to foster research and analysis on public policy issues of interest to older Americans. This paper represents part of that effort.

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Foreword

Underemployment, in the view of some employment observers, may be at least as serious a problem as unemployment, especially among older workers who have been downsized before they are ready to retire. These workers may be forced into jobs that are not commensurate with the ones they lost, or with their skills and abilities. Nonetheless, while a number of studies have examined underemployment, as well as job change and downward mobility, the issue of underemployment and the older worker has received scant attention. Analyses by the Congressional Budget Office (CBO) in 1993 point to the potential severity of underemployment for older displaced workers, who, upon job loss, are far less likely than their younger counterparts to become reemployed and far more likely to leave the labor force. When older displaced workers do find work, they are also apparently more likely than younger job finders to experience a sizable earnings decline. For example, according to the CBO, over half of aged 60-plus workers displaced in the 1980s who eventually managed to find work ended up earning less than 80 percent of what they had been earning in their old jobs. They were, in fact, nearly 15 percentage points more likely than workers between the ages of 18 and 34 to experience an earnings loss of this magnitude.

Concern about the extent to which older workers, perhaps as a result of corporate down-sizing, restructuring, reengineering, and/or the growth of the contingent workforce, might be experiencing underemployment led the Public Policy Institute to commission research aimed at answering a very basic question: How big a problem is underemployment for older workers today? Underemployment has consequences not only for current income and well-being but for retirement-income security as well.

Undertaken by William Crown and Thomas Leavitt of Analytic Resources, the study discussed in this report was designed to examine the nature and extent of underemployment, with a particular focus on who is underemployed, what underemployment consists of, and how and under what conditions the underemployment of older workers might differ from that of younger workers. Using the Current Population Survey for 1979, 1988, and 1993, Crown and Leavitt looked at two groups of underemployed workers: (1) workers who are employed part-time because they cannot find full-time work and (2) workers who are employed in jobs below their skill and education levels. To their knowledge, this is the first study to focus specifically on the underemployment of older workers, a study that concludes that underemployment characterizes a sizable portion of the older pre-retirement workforce. Crown and Leavitt report that nearly 400,000 workers between the ages of 50 and 64 were underemployed because they could not find full-time work. Though further refinements of the Type II estimates are called for--job tenure, in particular, needs careful consideration--preliminary estimates suggest that perhaps as many as 7.2 million 50-to-64-year-old workers are employed in jobs below their skill and/or educational level and hence qualify as underemployed according to the second definition.

Sara E. Rix
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Executive Summary

Background

The underemployed have received less attention from researchers and policymakers than the unemployed, but knowing the nature and scope of underemployment is important for a full understanding of the work-retirement transition as it has evolved over the years. Furthermore, current concerns about the implications of population aging for Social Security financing have led to a greater emphasis on programs or policies designed to increase the labor force participation of older persons. Without understanding the current barriers to full employment experienced by the underemployed, such policies might well have unintended consequences. For instance, scheduled increases in the actuarial reductions of Social Security benefits associated with early retirement may have serious equity implications, forcing many low-income workers to remain in the labor force, while having little impact on the retirement decisions of higher-income workers.

Purpose

Underemployment and the Older Worker: How Big a Problem? was designed to examine the nature and the relative incidence/importance of different forms of underemployment, as well as how and under what conditions the underemployment of older workers differs from that of younger workers. The basic question the investigators were asked to address was: How big a problem is underemployment for older workers today?

Methodology

Data from the May 1979, May 1988, and April 1993 Current Population Surveys (CPS) were used in the research. William Crown and Thomas Leavitt of Analytic Resources examine two types of underemployment, which they term Type I and Type II underemployment. Type I underemployment, which can be directly estimated from CPS data, refers to workers who want full-time work but can only find part-time employment.

Type II underemployment encompasses full- and part-time workers employed at jobs below their education and skill levels. The investigators employed a multivariate approach to examine this type of underemployment. For their purposes, Type II underemployment was defined by comparing each worker's actual wages to the expected wages for a worker with similar education, demographic characteristics, industry and occupation, region, and size of firm. Expected wages were calculated by estimating a multiple regression model of wages and then using this model to predict the wages for each worker, given his or her characteristics. If a worker's actual wage was less than or equal to 75 percent of the expected wage, that worker was classified as under-employed according to the Type II definition.

Principal Findings

This study appears to be the first to focus specifically on the underemployment of older workers. CPS data for 1979, 1988, and 1993 indicate that Type I underemployment--workers who want but cannot find full-time employment--has been steadily rising over time. The Type I underemployed were found to be an extremely disadvantaged group in terms of pension and health insurance coverage.

The Type II definition of underemployment among older workers was based on wages. As with the Type I underemployed, the investigators found that workers classified as underemployed by the Type II definition were disadvantaged.

Nearly 400,000 workers between the ages of 50 and 64 were estimated to be underemployed according to the Type I definition. The estimated number of underemployed by the Type II definition was much larger, 7.2 million. Approximately 61 percent of the Type I underemployed were also underemployed according to the Type II definition.

Conclusions

The magnitude of the numbers, particularly with respect to Type II underemployment, underscores the potential significance of underemployment for older workers. However, the estimated magnitude of Type II underemployment was very sensitive to the wage threshold used, an observation that highlights the desirability of further work to refine the estimate of the number of Type II underemployed. Nonetheless, the fact that the Type II estimates of underemployment were much larger than the Type I estimates, even using the most stringent criteria of the investigators, illustrates the potential significance of this type of underemployment for older workers.

Underemployment and the Older Worker: How Big a Problem?

Introduction

In recent years, the transition from full labor force participation to retirement has become considerably more varied. The availability of pension benefits for workers in their 50s and the popularity of early retirement incentive programs (ERIPs) that encourage early departures from long-term jobs have resulted in an increasing pool of younger workers who have "retired" before becoming eligible for Social Security benefits. This pool has been further increased by discouraged older workers forced out of downsizing companies. Some may be able to afford retirement, but many cannot. Moreover, many of these individuals want to work (Quinn and Burkhauser 1994). Studies have shown that 30 to 40 percent of such retirees eventually reenter the labor market (Ruhm 1990). However, although some of these jobseekers find the employment situations they are looking for, others have difficulty. In particular, many older workers cannot find the amount of work they want, and others are employed in jobs below their education or skill level. These are the underemployed.

The underemployed have not received the attention from researchers and policymakers that the unemployed have received. Knowing the nature and scope of underemployment, however, is important to a full understanding of the work-retirement transition as it has evolved over the years. Furthermore, current concerns about the implications of population aging for Social Security financing have led to greater emphasis on programs or policies designed to increase the labor force participation of older persons. Without taking into consideration the current barriers to full employment experienced by the underemployed, such policies might well have unintended consequences. For example, scheduled increases in the actuarial reductions of Social Security benefits associated with early retirement may have serious equity implications, forcing many low-income workers to remain in the labor force, while having little impact on the retirement decisions of higher-income workers.

Previous Research on Underemployment

According to Nord, Phelps, and Sheets (1989), researchers have defined underemployment in a variety of ways since the mid-1960s. Definitions have ranged from employment in jobs below a worker's educational and skill level, to inability to get a full-time job, to indices designed to measure inadequate earnings. Although there is a fairly substantial literature on underemployment, we were not able to identify any studies of underemployment that have focused specifically on workers aged 65 or older. Most studies of underemployment have tended to look at workers under 65 (see, e.g., Nord, Phelps, and Sheets 1989). Others have included the elderly as a subgroup in analyses but have not explicitly discussed the findings for workers 65 or older. As a case in point, Jacobs (1993) includes the age categories 55 to 64 and 65-plus in tables of the labor force transitions of underemployed workers but does not single them out for special attention.

Jacobs defines underemployed workers as persons who are working part-time for economic reasons. Workers considered underemployed for economic reasons include those who "could only find part-time work" or who were working part-time because of "slack work or material shortages." Although Jacobs does not discuss the results for older underemployed workers in his paper, the data presented in his tables highlight striking differences in the pathways out of underemployment for older male and female workers.

Jacobs shows, for example, that 53 percent of underemployed women aged 65 or older in 1975 remained part-time workers in 1976, while 5 percent switched to full-time work, 11 percent became unemployed, and 31 percent left the labor force. The pattern was similar for transitions over 1987-88. During the latter period, 55 percent of the older underemployed women remained part-time in 1988, while 9 percent switched to full-time, 3 percent became unemployed, and 34 percent left the labor force.[1] Considering the small sample sizes (39 for 1975-76 and 49 for 1987-88), these patterns--especially for those who remain part-time or retire--appear to be remarkably stable.[2]

Interestingly, the transition patterns of underemployed older men appeared to change considerably between 1975-76 and 1987-88. Over 1975-76, 40 percent of underemployed men 65 and older continued part-time, 6 percent switched to full-time, 11 percent became unemployed, and 43 percent left the labor force. In contrast, in the 1987-88 time frame, 63 percent remained part-time, 5 percent switched to full-time, 6 percent became unemployed, and 26 percent left the labor force. Thus, the proportion of older underemployed men remaining part-time increased by 23 percentage points over 1975-76 to 1987-88, while the percentage leaving the labor force declined from 43 percent to 26 percent.[3]

What interpretation can be given to these trends? The stability of the labor force transitions of underemployed females aged 65 and older is broadly consistent with the relative stability of their labor force participation rates over time. In contrast, the increasing proportion of underemployed men 65 and older who remain part-time workers and the decreasing proportion who leave the labor force are at odds with the declining labor force participation rates of older men in general. Is this indicative of fundamental differences in the labor force behavior of underemployed versus typical older workers? Or is it a result of a flaw in the definition of underemployment for older workers?

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[1] Due to rounding, totals here and in some tables may not always sum to 100.

[2]The sample sizes for underemployed women who shift to unemployment or full-time employment are too small to support reliable inferences.

[3]Peracchi and Welch (1994) conducted a similar analysis that focused on the labor force transitions of older men and women. However, their analysis is broader in scope and does not deal specifically with underemployment among older workers.

A related issue is the trend in underemployment among older workers over time. Several authors (e.g., Blank 1990, Ichiowski and Preston 1986) have demonstrated that the rate of underemployment for the labor force in general has been rising for the past two decades. They present no information on the trend in underemployment among workers 50 and older.

Methods

In this paper, two categories of underemployed workers are identified: (1) Type I underemployed, which refers to part-time workers who cannot find full-time employment, and (2) Type II underemployed, defined as full- or part-time workers employed at jobs below their education and skill levels. Current Population Survey (CPS) data are used to examine the nature and extent of both types of underemployment.

The CPS is a monthly survey of the civilian noninstitutionalized population. Conducted for over 50 years, its primary purpose is to serve as the official source for federal government statistics on employment and unemployment. The CPS also provides detailed information on demographic characteristics, educational attainment, economic status, and labor market activities of U.S. households.

The two types of underemployment require different strategies for analysis. In May 1979, May 1988, and April 1993, the CPS included supplemental surveys on employee benefits. Since information on pension and health insurance benefits is important for understanding the extent to which an older worker's employment situation is voluntary, the analysis of Type I underemployment is based on 1979, 1988, and 1993 CPS data. The analysis of Type II underemployment, which requires a multivariate approach, is based on the April 1993 CPS only.

These analyses focus on the underemployed aged 50 and older. Although this is the age range where physical limitations, in combination with job characteristics (e.g., heavy lifting, repetitive motion), may force some workers to cut back on the number of hours they are working, it is important to recognize that workers employed less than full-time due to physical limitations are not the same as workers unable to find full-time employment.

Age 50 is also generally the earliest year that individuals are allowed to collect employer pension benefits. Some older persons with large expected retirement incomes may decide to work in part-time or full-time jobs that would initially lead to their classification as underemployed. One of the most difficult challenges of defining underemployment among older workers is distinguishing those who are "underemployed" at full-time jobs by choice from those who are underemployed because they cannot find work at their education or skill level.

As described below, we believe that pension and health coverage data are useful in helping to make this distinction, although this is undoubtedly an area where more research would be fruitful. The 50-to-64 age group permits the inclusion of a sample of workers who may be displaced from downsizing companies. These workers are also likely to be underemployed as they experience difficulties finding jobs that fully utilize their education and skill levels. Despite the fact that we do not separately identify displaced workers in our analysis, this group is often targeted in downsizing efforts, especially in ERIPs.[4]

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[4]For a recent review of the literature regarding ERIPs, see Mutschler (1996).

Type I Underemployment

Part-time workers who desire but cannot find full-time work can be directly identified from CPS data. Workers who usually work less than 35 hours per week are asked the reason why they work less than 35 hours. For our analyses of Type I underemployment, respondents who said that they "could find only part-time work" were designated as underemployed workers.

Type II Underemployment

Many studies have defined underemployment in terms of inadequate earnings. Yet, the failure to earn adequate earnings (usually defined as exceeding 125 percent of the poverty level)[5] is not necessarily indicative of underemployment. Many individuals who earn low wages may simply have poor job skills and low productivity. As a consequence, in the present study, Type II underemployment is defined in a new way. First, a multivariate model of wages as a function of education level, gender, race, region of the country, industry, and occupation generates a predicted value for wages for each person given his or her characteristics. Then, the actual wage that the person was paid is compared to the predicted wage. If the actual wage is more than 25 percent lower than the predicted wage, the individual is categorized as underemployed by the Type II definition.

Type I Underemployment: Descriptive Findings

As noted above, workers are categorized as Type I underemployed if they are working part-time and they desire but cannot find full-time work. In this section, Type I underemployment among workers between the ages of 50 and 64 in 1979, 1988, and 1993 is examined. This is followed by a profile of the Type I 50-to-64-year-old underemployed population, which depicts the underemployed in terms of their gender, marital status, education, race/ethnicity, and union status. This profile is compared to the profiles of other part-time workers and full-time workers in the same age group.

The incidence of Type I underemployment in the 50-to-64 age group is then compared to Type I underemployment among both younger (under 50) and older (65-plus) workers. Finally, pension coverage, pension receipt, and health insurance coverage within the 50-to-64-year-old Type I underemployed population are examined. Since this study looks at workers who, by definition, are working less than they would like, it is relevant to examine the extent to which their underemployment may be a threat to their health coverage and to their retirement-income security as they approach retirement age.

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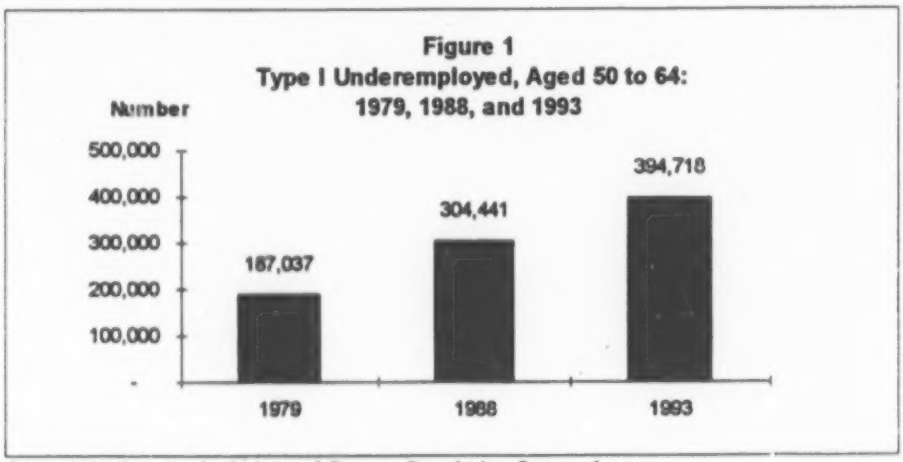
[5]See, for example, Nord, Phelps, and Sheets (1989).

Type I Underemployment Among Workers Between the Ages of 50 and 64

Type I underemployment among part-time workers between the ages of 50 and 64 grew 111 percent during the 1979-1993 period, from 187,037 to 394,718 persons (Figure 1). In other words, in 1993 there were over 200,000 more middle-aged workers who wanted full-time work but could only find part-time employment than there had been in 1979. Still, although the underemployment *rate* doubled during the same period, the Type I underemployed between the ages of 50 and 64 represented a small proportion of the middle-aged workforce in both 1979 and 1993 (1 percent and 2 percent, respectively).



Source: Authors' calculations of Current Population Survey data.

The underemployed also became a larger percentage of the middle-aged, part-time workforce over the years. In 1979, 5.3 percent of part-time workers between the ages of 50 and 64 were Type I underemployed. This number grew to 8 percent in 1988 and 8.9 percent in 1993.

Considerable variation exists in the Type I underemployment rate along a number of dimensions, as can be seen in Table 1. Underemployment rates often mirror unemployment rates. Single people, females, minorities, and persons with less education tend to have the higher underemployment rates. For example, in 1993, the underemployment rate for middle-aged single[6] individuals was twice the rate for married persons (3.3 percent vs. 1.6 percent); females were nearly three times more likely to be underemployed than males (3.2 percent vs. 1.1 percent); blacks (4 percent) and Hispanics (3.8 percent) were more than twice as likely to be Type I underemployed as whites (1.7 percent); and workers with a high school education or less were more than twice as likely to be underemployed as those who had a college degree or a postgraduate education. As of 1993, however, there was little variation by age within the 50-to-64 age group. Nor were regional differences all that pronounced.

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[6] "Single" includes all nonmarried respondents.

TABLE 1

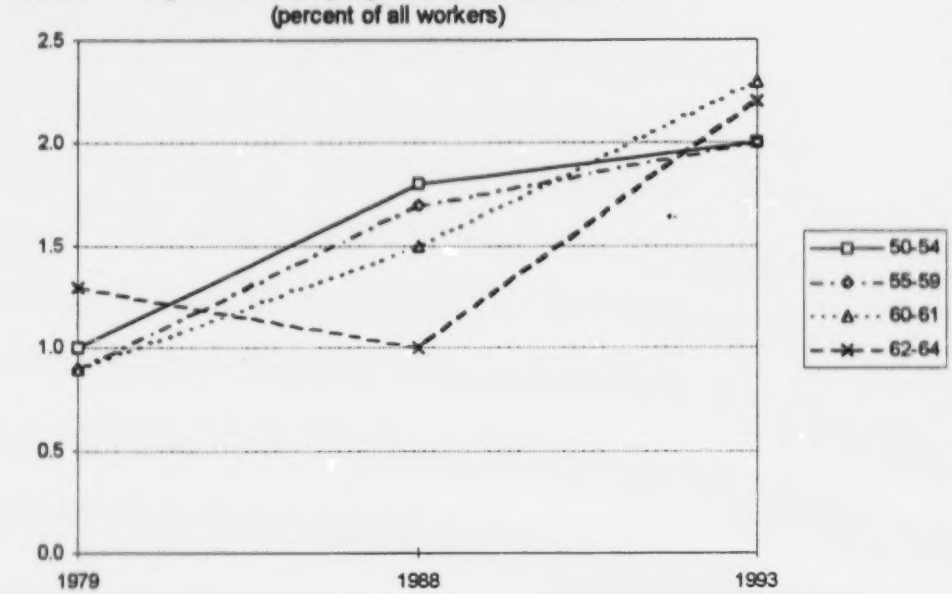
TYPE 1 UNDEREMPLOYMENT RATES OF WORKERS AGED 50-64, BY SELECTED CHARACTERISTICS: 1979, 1988 AND 1993

Characteristic	Percent of All Workers Age 50 to 64 Who Are Type I Underemployed			Percent of Part-time Workers Aged 50 to 64 Who Are Type 1 Underemployed		
	1979	1988	1993	1979	1988	1993
Age						
50-54	1.0	1.8	2.0	6.1	10.3	10.5
55-59	0.9	1.7	2.0	5.0	8.6	9.3
60-61	0.9	1.5	2.3	5.0	6.6	8.9
62-64	1.3	1.0	2.2	4.3	3.1	5.8
Gender						
Male	0.5	0.9	1.1	4.4	7.0	7.4
Female	1.8	2.6	3.2	5.7	8.5	10.1
Marital Status						
Married	0.7	1.3	1.6	4.0	6.6	7.2
Single	2.1	2.8	3.3	10.1	12.3	14.4
Education						
8th grade or less	1.7	3.5	2.5	7.7	15.5	10.0
Some high school	1.3	2.7	5.6	6.7	12.8	21.3
High school graduate	0.9	1.6	2.2	4.7	7.3	9.1
Some college	0.6	0.9	1.6	3.4	4.3	7.2
College graduate	0.4	1.2	0.8	2.8	7.1	4.2
Postgraduate education	0.8	0.4	0.5	6.6	2.5	3.1
Region						
Northeast	1.4	1.0	2.3	7.4	5.3	10.4
Midwest	0.9	1.6	1.9	4.9	7.5	8.3
South	0.7	1.9	2.2	3.4	9.6	9.7
West	1.3	1.9	1.7	6.4	8.6	7.7
Race/Ethnicity						
White	0.8	1.3	1.7	4.6	6.1	7.3
Black	2.6	2.8	4.0	10.6	15.2	17.9
Hispanic	1.6	4.9	3.8	9.3	24.7	18.3
Other	0.8	2.6	3.1	4.4	15.0	15.7

Source: Authors' calculations of Current Population Survey data.

Some changes over time are noteworthy. For example, Figure 2 illuminates the 1979-1993 trends in Type I underemployment rates by age. Underemployment rates increased for all age subgroups over the 14-year period, although the rate for workers between the ages of 62 and 64 did, for reasons that are not clear, decrease slightly between 1979 and 1988. The under-employment rate increased the most for workers between the ages of 60 and 61, who had had the lowest rate in 1979 (0.9 percent) and the highest rate in 1993 (2.3 percent). Contributing to this higher underemployment rate among 60- and 61-year-old workers could be some form of pre-retirement transitional employment, i.e., a shift from long-term or career positions to "bridge" jobs in order to supplement pension incomes with earnings until becoming eligible for Social Security benefits at age 62 (Ruhm 1990). Some of these workers may be employed in bridge jobs voluntarily; others may have been targeted by corporate downsizing and have no choice but to work in part-time jobs.

Figure 2
Type i Underemployment Among All Workers Aged 50 to 64, by Age: 1979, 1988, and 1993
(percent of all workers)



Source: Authors' calculations of Current Population Survey data.

Type I underemployment rates were higher for middle-aged females than for males in each of the three years. The difference between male and female rates increased during the 14-year period, from 1.3 percentage points in 1979 to 2.1 percentage points in 1993.

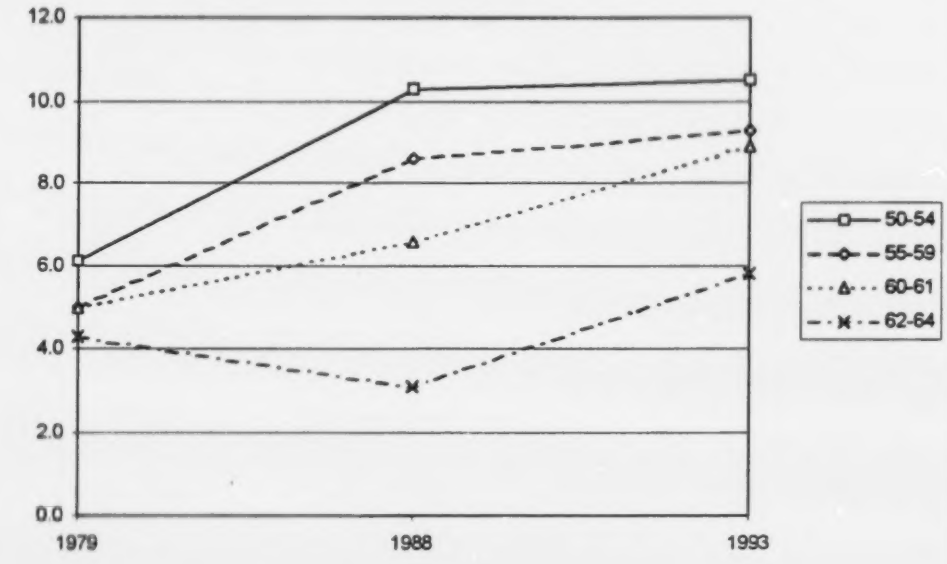
Single workers were more than twice as likely to be Type I underemployed as married workers throughout the 1979-1993 period, a difference that increased only slightly, from 1.4 percentage points in 1979 to 1.7 percentage points in 1993.

Minority workers were consistently more likely to be Type I underemployed than white workers. Blacks and Hispanics were at least twice as likely to be underemployed as whites in each of the three tabulated years. Moreover, the difference between black, Hispanic, and white underemployment rates widened over the years. In 1979, the Hispanic underemployment rate was 0.8 percentage points higher than the white rate and the black rate was 1.8 percentage points higher. By 1993, the Hispanic-white difference was 2.1 percentage points and the black-white difference was 2.3 percentage points.

As noted above, the proportion of part-time workers between the ages of 50 and 64 who were employed part-time because they could not find full-time work also rose over the period of the study, an increase that characterized the workforce as a whole. Indeed, while the total "voluntary" part-time workforce increased by 20 percent between 1979 and 1993, the involuntary part-time workforce rose by 86 percent (see, e.g., Employee Benefit Research Institute 1994: 10).

Table 1 also highlights the characteristics of Type I underemployed as a percent of the part-time workforce (see Figure 3 for age trends). While the patterns and trends are the same as those discussed above, the percentages themselves are, of course, substantially higher, since the part-time workforce is so much smaller. The higher percentages confirm the extent to which underemployment is a greater problem for women, minorities, the nonmarried, and the less educated.

Figure 3
Type I Underemployment Among Part-Time Workers Aged 50 to 64, by Age: 1979, 1988, and 1993
(percent of part-time workers)



Source: Authors' calculations of Current Population Survey data.

A Profile of the Type I Underemployed

Table 2 compares the age 50-to-64 Type I underemployed population in 1993 to other part-time workers and to full-time workers of the same age. What stands out starkly in that table is, with the exception of gender, how similar the "other" or voluntary part-time workers and full-time workers are to one another and how different both groups are from the Type I underemployed. Type I underemployed are considerably less likely to be married than other workers, more likely to be minorities, less likely to have completed high school, and less likely to be union members. However, both the Type I underemployed and other part-time workers are predominantly female, in contrast to full-time workers between the ages of 50 and 64, less than 40 percent of whom were males.

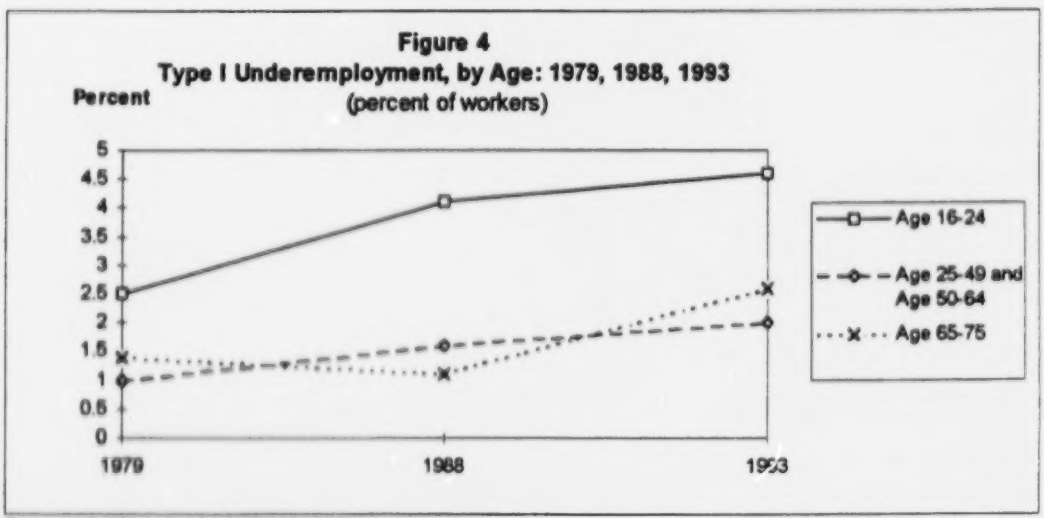
TABLE 2
SELECTED CHARACTERISTICS OF WORKERS AGE 50 TO 64, BY CLASS OF WORKER: 1993
(in percent)

Characteristic	Type I Underemployed	Other Part-time Workers	Full-time Workers
Gender			
Male	30	38	61
Female	70	62	39
Marital Status			
Married	59	75	74
Single	41	25	26
Education			
8th grade or less	8.1	7.3	6.5
Some high school	26.6	9.8	9.3
High school graduate	40.0	39.9	36.6
Some college or more	25.3	43.0	47.7
Race/Ethnicity			
White	67.3	84.8	82.1
Black	17.5	7.9	8.8
Hispanic	10.1	4.5	5.5
Other	5.2	2.8	3.5
Union Status			
Union member	9	17	23
Nonunion member	91	83	77

Source: Authors' calculations of Current Population Survey data.

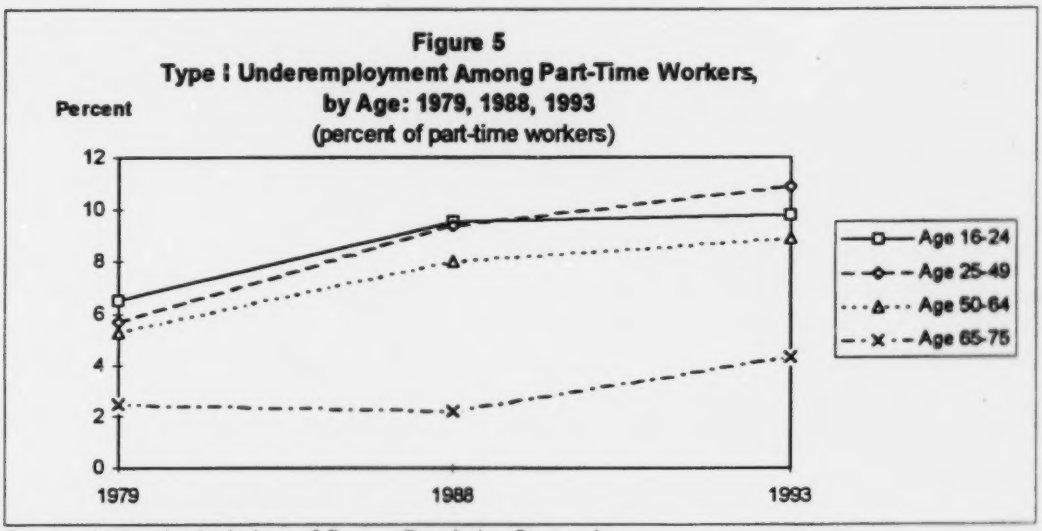
Levels of Type I Underemployment in Other Age Groups

Figures 4 and 5 compare Type I underemployment rates of different age groups in 1979, 1988, and 1993. As can be seen in Figure 4, there was virtually no difference in the likelihood of Type I underemployment among workers aged 50 to 64 and those aged 25 to 49 for *any* of the three years. The Type I underemployment rate for the workers between the ages of 65 and 75 was higher than that for workers 25 to 49 and 50 to 64 in 1979 and 1993 but was slightly lower in 1988; in every year, however, the differences were minor.



Source: Authors' calculations of Current Population Survey data.

When looking at underemployment as a percent of total underemployment, it is clear that Type I underemployment is a far greater problem for the youngest workers, ages 16 to 24, than for any of the other three age groups; in fact, it was about twice the rate of workers between the ages of 25 and 50. Still, its potential significance for older workers should not be dismissed out of hand; underemployment was higher in 1993 than in 1979 for all age groups, and the jump for the oldest workers in Figure 4--ages 65 to 74--between 1988 and 1993 after falling between 1979 and 1988, is of some interest. The explanation for this cannot be ascertained from CPS data.



Source: Authors' calculations of Current Population Survey data.

As a percentage of part-time workers, the picture looks a bit more dramatic, and, moreover, differences between workers ages 25 to 49 and 50 to 64 emerge. It is not clear whether the rapid rise in Type I underemployment was due to the targeting of older workers by downsizing firms during this period or to other reasons, such as a rising demand among older workers for full-time work.

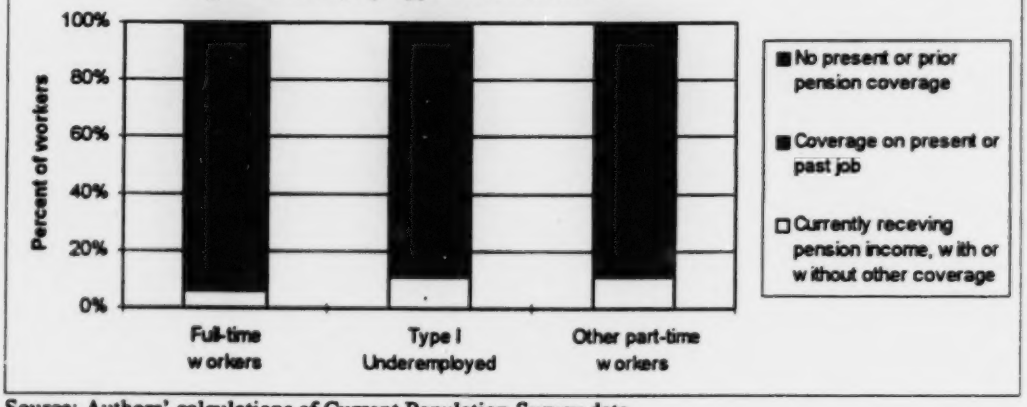
Pension Coverage, Pension Receipt, and Health Insurance Coverage

Workers between the ages of 50 and 64 are approaching or have already reached the age at which most workers retire. How secure are the Type I underemployed in this age group in terms of their pension coverage or receipt? How does their pension situation compare with that of full-time workers and other part-time workers in the same age group? Are the Type I underemployed protected by health insurance to the extent that other workers are?

Analysis of the 1993 CPS data indicates that the Type I underemployed are clearly a disadvantaged group in terms of pension coverage (Figure 6). Sixty-seven percent of the Type I underemployed had no present or prior coverage from which they could expect future retirement income. This compares with 52 percent of other part-time workers and 37 percent of full-time workers. Eleven percent of the 50-to-64-year-old Type I underemployed were already receiving pension income, suggesting that a significant portion of the Type I underemployed are retired individuals who find that they want or need full-time work.

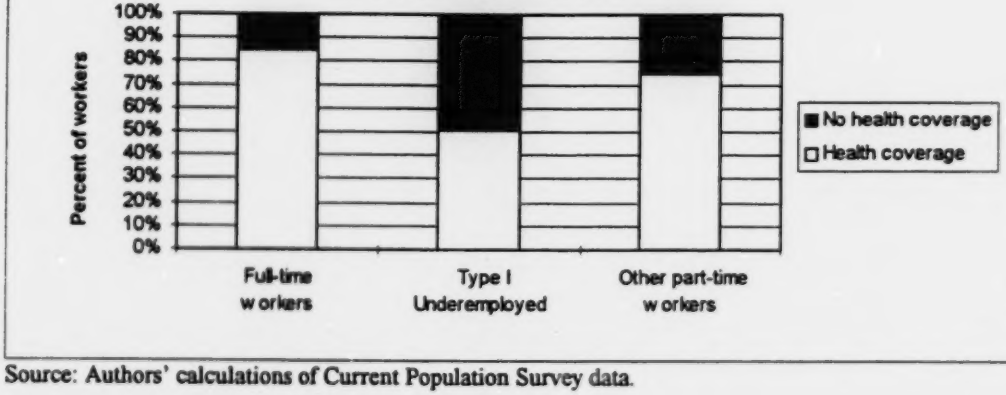
The Type I underemployed are also disadvantaged when it comes to coverage by group health insurance (Figure 7). Half of the Type I underemployed had no group health insurance compared with 25 percent of other part-time workers and 15 percent of full-time workers.

Figure 6
Pension Coverage and Receipt for Workers Aged 50 to 64, by Type of Worker: 1993



Source: Authors' calculations of Current Population Survey data.

Figure 7
Group Health Insurance Coverage for Workers Aged 50 to 64, by Type of Worker: 1993



Source: Authors' calculations of Current Population Survey data.

Combining the pension and health coverage data in one security measure, we see once again that the Type I underemployed are clearly less favored than other workers (Figure 8). Thirty-nine percent of the Type I underemployed had no pension receipt, pension coverage, or group health insurance coverage. This compares with 18 percent of other part-time workers and 10 percent of full-time workers. These data suggest that many of the Type I underemployed are probably seeking full-time work because they have had little security from their past or present employment.

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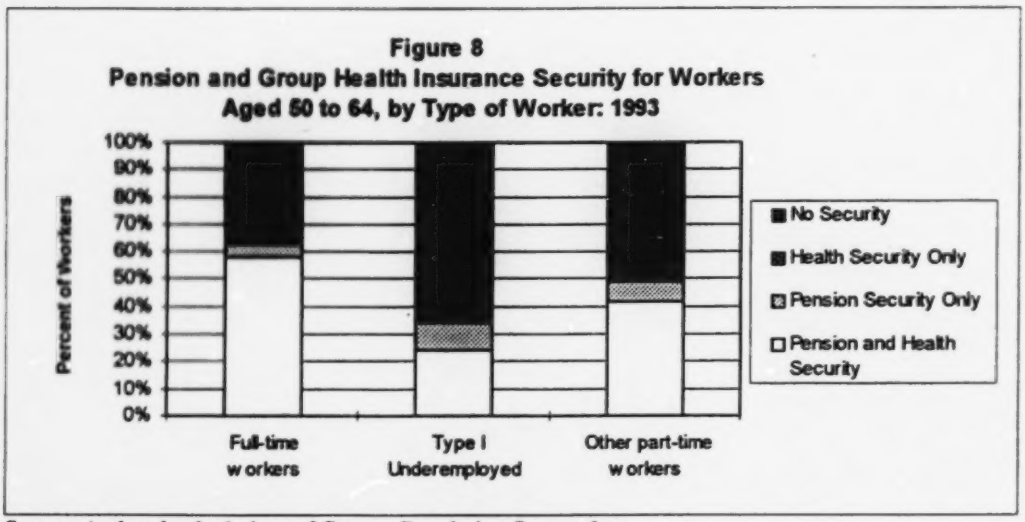

Source: Authors' calculations of Current Population Survey data.

A Multivariate Model of Type I Underemployment

The discussion thus far has focused on generating a descriptive profile of Type I underemployment. In this section, we build upon this descriptive analysis by estimating a multivariate model of Type I underemployment. Multivariate models are appropriate for identifying variables that are statistically significant predictors of a dependent variable of interest (in this case, Type I underemployment status), controlling for the effects of other explanatory variables. This is important because inferences based on bivariate analyses can be misleading. For example, in the discussion above, we noted differences in the racial and educational characteristics of underemployed workers compared with other workers. This suggests that both of these variables may be associated with the probability of being underemployed. Yet it is possible, for example, that after controlling for educational characteristics, no additional differences in underemployment by race would remain. If this were the case, it would indicate that education was the "real" predictor of underemployment, not race (although race might, in turn, influence access to education).

A multivariate regression model of Type I underemployment was estimated using the CPS data for 1993 (Table 3).[7] The results of the model confirm the descriptive findings reported above

[7]This model should be considered preliminary because it is based on regression analysis, rather than logit or probit (which are generally considered to be more appropriate techniques when the dependent variables takes on values of one or zero). Regression analysis was used to estimate the model because it provides more extensive diagnostic information than logit or probit models. For exploratory work, this is extremely helpful in assessing model specification. For example, tolerance and variance inflation factor statistics are available for multiple regression models but not for logit or probit models. These statistics enable the researcher to evaluate the role of multicollinearity as an explanation for statistically insignificant parameter estimates. (Multicollinearity is a statistical problem created by the correlation among explanatory variables which obscures the relationship of these variables with the dependent variable.) There was no evidence of multicollinearity for any of the variables in the model.

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and indicate that the probability of Type I underemployment is indeed influenced by marital status, gender, race and ethnicity, age, and education, as well as by industry and occupation. Married workers and males were less likely to be underemployed than unmarried workers. Blacks and Hispanics were more likely to be underemployed than white workers. Younger workers (ages 21 to 24) were more likely than workers between the ages of 25 and 44 to be underemployed; being older than 25 to 44 was not statistically significant.

Persons employed in the service *industry* were more likely to be underemployed and workers in manufacturing less likely to be underemployed than those in other industries. Those in blue-collar *occupations* were more likely to be underemployed than those in white-collar occupations, but interestingly, persons employed in service occupations were *less* likely to be underemployed. Finally, workers with education beyond high school (some college, college graduates, graduate school) were less likely to be underemployed, whereas workers with less than a high school education (less than 8th grade, 9-11th grade) were more likely to be underemployed than those with a high school diploma. Neither firm size nor region was a statistically significant predictor of Type I underemployment.

Overall, the model is statistically significant, as indicated by the F-statistic. However, the adjusted R-square reveals that the model explains a mere 1.5 percent of the variance in underemployment status (Table 3). Quite obviously, other predictors of underemployment exist which have been excluded from the model.

Type II Underemployment of Older Workers

Type II underemployment in this study is defined by comparing each worker's actual wages to the expected wages for someone with similar education, demographic characteristics, industry and occupation of employment, region, and size of firm. Expected wages were calculated by estimating a multiple regression model of wages and then using this model to predict the wages for each worker, given their characteristics. If a worker's actual wage is less than or equal to 75 percent of the expected wage, he or she is classified as underemployed by the Type II definition. The Type II underemployment analysis was conducted using all workers in the 1993 CPS sample age 21 and older. The results are shown in Table 4.

In general, the factors that are associated with higher wages conform to expectations. Wages tend to be higher for males, as well as for workers in manufacturing, workers with education beyond high school, employees of larger firms, workers in the Northeast or the West, and workers aged 45 and older. Wages tend to be lower for workers in blue collar or service occupations, minority workers, those with less than high school education, and workers under age 25. The characteristics of the Type II underemployed workforce identified using this wage model are reported in Table 5.

Region, Gender, and Marital Status

Type II (low-wage) underemployment was the highest in the South in all age groups. Interestingly, however, there appears to be little difference in the regional distribution of Type II underemployment by age category.

TABLE 3
MULTIPLE REGRESSION MODEL OF TYPE I UNDEREMPLOYMENT

Variable	Coefficient	t-statistic
Married	-0.0114	-8.447
Male	-0.0095	-7.041
Black	0.0066	2.904
Hispanic	0.0054	1.998
Other	0.0027	0.92
Age 21-24	0.0128	5.595
Age 45-54	-0.002	-1.242
Age 55-64	-0.003	-1.439
Age 65+	-0.0039	-1.089
Manufacturing	-0.0134	-7.228
Service (industry)	0.0048	3.314
Blue-collar occup.	0.0116	7.48
Service (occupation)	-0.0097	-5.088
Grade 8	0.0119	3.376
Some high school	0.0197	7.671
Some college	-0.009	-5.73
College graduate	-0.0132	-6.988
Postgraduate	-0.0163	-6.538
Firm size 100-499	-0.0041	-1.217
Firm size 500-999	-0.0005	-0.103
Firm size 1000+	-0.0023	-1.312
Northeast	0.0011	0.717
West	0.0028	1.693
Constant	0.0372	18.162
Adjusted R-Square	0.0148	
F-Statistic	39.6	
Sample size	59,000	

Source: Authors' calculations of Current Population Survey data.

TABLE 4
MULTIPLE REGRESSION MODEL OF WAGES

Variable	Coefficient	t-statistic
Married	1.5835	8.022
Male	3.9884	20.28
Black	-0.7367	-2.203
Hispanic	-1.0226	-2.569
Other	-0.4557	-1.022
Manufacturing	1.046	3.847
Age 21-24	-3.2966	-9.714
Age 45-54	1.7402	7.555
Age 55-64	1.4011	4.616
Age 65+	4.8075	8.765
Service (industry)	-0.4679	-2.213
Blue-collar occup.	-1.6519	-7.261
Service (occupation)	-1.3799	-4.944
Grade 8	-3.5193	-6.656
Some high school	-1.7277	-4.585
Some college	1.8957	8.269
College graduate	5.37	19.37
Postgraduate	10.3731	28.578
Firm size 100-499	0.2321	0.658
Firm size 500-999	0.7426	1.58
Firm size 1000+	1.3199	6.453
Northeast	1.622	7.368
West	1.2938	5.459
Constant	7.0569	23.081
Adjusted R-Square	0.104	
F-Statistic	138.9	
Sample size	27,300	

Source: Authors' calculations of Current Population Survey data.

The Type II underemployed are also more likely to be male than female, except in the 45-to-54 age group, where the odds are essentially equal. The concentration of Type II underemployment is particularly high in the 21-to 34-age group, where 64 percent of low-wage underemployed workers are male. Note that care must be taken in interpreting these findings, however. They do *not* necessarily imply that males have a higher rate of Type II underemployment than females--only that the majority of low-wage underemployed workers are male. The percentages reported in Table 5 are also influenced by the distribution of the respective variables in the labor force at large. For example, if 80 percent of the labor force were male, females could have a much higher *rate* of underemployment and still have a smaller reported percentage than males in Table 5.

TABLE 5
CHARACTERISTICS OF TYPE II UNDEREMPLOYED BY AGE
(in percent)

Variable	21 to 34	35 to 44	45 to 54	55 to 64	65+	All Ages
Region						
Northeast	22.9	21.8	23.8	24.1	25.4	23.1
Midwest	26.4	25.2	23.7	26.8	26.0	25.6
South	28.5	29.6	29.0	30.1	30.4	29.1
West	22.2	23.4	23.5	19.1	18.2	22.2
Gender						
Male	64.4	55.4	49.5	55.5	56.8	57.8
Female	35.6	44.6	50.3	44.5	43.2	42.2
Married	53.2	76.6	77.9	78.4	62.7	67.3
Race						
White	80.0	81.3	84.3	86.6	88.1	82.3
Black	8.1	8.2	6.2	6.0	6.7	7.4
Hispanic	7.2	5.2	5.4	3.1	2.3	5.6
Other	4.7	5.3	4.2	4.3	2.9	4.6
Education						
8th grade or less	1.6	2.0	3.6	7.0	15.5	3.4
Some high school	5.9	5.0	6.5	10.0	11.5	6.5
High school graduate	31.5	31.3	36.7	39.1	37.5	33.7
Some college	32.4	28.5	22.1	19.3	15.3	27.0
College graduate	22.4	20.5	17.1	14.0	11.1	19.3
Postgraduate education	6.2	12.6	14.0	10.7	9.2	10.0
Industry						
Mining	0.3	0.5	0.3	0.4	0.2	0.3
Construction	5.3	6.1	4.8	3.8	1.9	5.1
Manufacturing	14.8	15.6	14.7	13.4	8.8	14.5
Trans/Comm	5.2	5.3	6.0	4.8	3.3	5.2
Trade	29.1	21.4	21.7	25.7	23.7	25.0
Fin/Ins/Real estate	5.5	4.8	5.4	6.4	6.9	5.5
Services	33.1	37.7	39.5	35.7	42.1	36.3
Other	6.7	8.7	7.7	9.8	13.2	8.0
Occupation						
White collar	42.1	45.2	47.0	39.5	38.8	43.4
Blue collar	25.7	24.5	25.8	31.2	34.4	26.5
Service	16.0	15.4	15.2	14.5	9.6	15.2
Other	16.2	14.9	12.0	14.8	17.2	14.9

TABLE 5 (cont.)
CHARACTERISTICS OF TYPE II UNDEREMPLOYED BY AGE
(in percent)

Variable	21 to 34	35 to 44	45 to 54	55 to 64	65+	All Ages
Health Ins. Coverage						
Self and family	31.4	46.0	46.4	43.3	28.8	39.2
Self only	36.7	25.8	29.8	32.1	32.1	32.0
None	31.3	28.1	23.6	24.4	39.1	28.5
Pension coverage	22.2	29.0	33.7	26.9	16.1	26.4
Type I Underemployed	3.6	3.3	3.0	3.5	2.3	3.3

Source: Authors' calculations of Current Population Survey data.

Similarly, differences in the distribution of marital status across age groups are evident among the low-wage underemployed. Again, these differences probably reflect marital status distributions by age in the labor force at large. Type II underemployed workers ages 21 to 34 and 65-plus were less likely to be married than workers aged 35 to 64.

Race

Table 5 indicates a general increase in the concentration of Type II underemployment among white workers in higher age groups. It is possible that this increase reflects higher labor force participation rates of whites, but we suspect that these relationships are very complex. For example, it is a well-known fact that labor force participation rates among older people are strongly influenced by the availability of adequate retirement income. Some older workers are in the labor force because their nonearnings retirement income is insufficient. Others are in the labor force in bridge jobs, working only until they become eligible for Social Security benefits at age 62. Still others are in the labor force because they enjoy their work, even though they could afford to retire. Differences in the adequacy of retirement incomes by race, therefore, are likely to have strong influences on labor force participation rates and, in turn, on Type II underemployment.

Education

The educational distribution of Type II underemployment is very pronounced. Older low-wage underemployed workers are much more likely to have lower education levels than younger workers. This probably partly reflects differences in educational attainment across age cohorts (education levels have been rising over time). However, the large increase in the percentage of Type II underemployed in the 55-to-64 and 65-plus age groups suggests an additional explanation for the higher rate of low-wage underemployment beyond cohort differences in educational attainment (e.g., age discrimination against poorly educated older workers, which forces them into very low paying jobs). Still, the multiple regression approach controls for the effects of education on the predicted wage of these workers. To be considered underemployed by the Type

II definition, the wages they are earning must be substantially lower than the predicted wage given their education and other characteristics.

Industry and Occupation

The most notable differences in the industrial distribution of Type II underemployment seem to occur with the 65-plus age group compared with the younger age groups. The percentage of low-wage underemployed workers 65 and older in manufacturing declines to 8.8 percent, whereas the percentage working in the service industry increases to 42.1. This does not appear to reflect general labor force patterns of retiring from a career job in manufacturing and working in a bridge job in services, since persons 65-plus are already eligible for Social Security benefits. These Type II underemployed age 65-plus are probably a mix of low-wage workers with inadequate retirement incomes and low-wage workers with adequate retirement incomes who chose to continue working for noneconomic reasons.

The occupational distribution of Type II underemployment appears to be even more complex than the industrial distribution. The decline in the percentage of age 65-plus workers in the service occupations is especially noteworthy and seemingly inconsistent with the higher percentage of age 65-plus workers in the service industry. However, the service industry effects just discussed may be reflected in the decline in white-collar underemployment and the increase in blue-collar underemployment at ages 55 and older.

Health Insurance and Pension Coverage

Lack of employer health insurance coverage among the Type II underemployed declines with age through the 45-to-54 age group, remains essentially stable in the 55-to-64 group, and then rises with the 65-plus group. (Presumably, employer health insurance coverage is a much weaker incentive to work for persons aged 65 and older because of Medicare.) Similarly, employer pension coverage rises through the 45-to-54 group, declines among those aged 55 to 64, and falls precipitously in the 65-plus group. Trends in employer health insurance and private pension coverage in the 65-plus group are probably related mainly to part-time employment status. However, the availability of these benefits is correlated with race, gender, industry and occupation, firm size, region, and other factors. Thus, it is likely that these other dimensions are also part of the explanation for the lower rate of health insurance and private pension coverage among the Type II underemployed 65 and older.

Type I Underemployment

The incidence of Type I underemployment (i.e., involuntary part-time workers) among the Type II underemployed population is highest in the 21-to-34 and 55-to-64 age groups and lowest in the 65-plus group. The primary reason that the Type I underemployment constitutes such a small percentage of the Type II group is that the size of the latter group is much larger. For example, as reported earlier, approximately 400,000 workers age 50 to 64 were considered underemployed by the Type I definition. In contrast, about 7.2 million workers age 50-64 are considered underemployed by the Type II definition. Interestingly, however, the percentage of

Type I underemployed who are also considered underemployed by the low-wage Type II criteria is substantial, 61 percent.

The large magnitude of Type II underemployment relative to Type I underemployment has at least two possible explanations. First, Type II underemployment includes both full-time and part-time workers in its definition, whereas Type I underemployment includes only part-time workers. Second, some workers classified as underemployed by the Type II criteria are in low-wage jobs by choice. One aspect of this issue is the stringency of the wage threshold criteria used. In this study, we used 75 percent of expected wages as the threshold for defining Type II under-employment, but this is admittedly arbitrary. We did, however, experiment with alternative thresholds to assess their affects on the size of the population classified as Type II under-employed.

The impacts of making the wage threshold used in the definition of Type II underemployment more stringent are substantial. For instance, using a wage threshold of 50 percent of predicted wages reduces the estimated size of the Type II population by approximately 58 percent. Using a wage threshold of 25 percent reduces the estimated size of the Type II underemployed labor force by 89 percent. This is an area that could benefit from additional research.

Because some older workers may be employed in lower paying jobs by choice, any estimate of Type II underemployment derived by this approach will tend to be an overestimate for the wage threshold chosen. Nevertheless, we believe that the approach suggested in this paper for estimating Type II underemployment is a significant improvement over using 125 percent of the poverty line as the threshold because the latter is not tied to worker or job characteristics. Clearly, however, improvements in operationalizing the Type II approach are necessary before it can be used as a reliable measure of low-wage underemployment among workers 50 years of age and older.

Directions for Future Research

One refinement of the research presented in this paper would be to focus the Type II analysis on full-time workers alone, since we can already classify part-time workers in terms of their voluntary or involuntary status. Presumably, part-time workers who are employed in low-wage jobs voluntarily should not be classified as Type II underemployed.

Another area of refinement would be to estimate separate wage models for each age group. This approach would control for the influences of cohort differences in demographic composition and education on wages and enable the wage thresholds to be calculated separately for each group.

A related, and very important area of work--particularly if further refinements in the definition of Type II underemployment can be obtained---would be to estimate multivariate models of the risk of being low-wage underemployed similar to the approach used for the Type I underemployed. Type I and Type II multivariate analyses should be conducted using logit or probit models, based on the preliminary work done with multiple regression models.

In addition, the importance of job tenure or seniority needs careful attention in subsequent research. For example, Shapiro and Sandell (1987: 38) observed in their research that a very high percentage of the wage reduction among older reemployed men could "be attributed to the nontransferability of workers' firm-specific skills and knowledge associated with seniority." Clearly, findings such as this are germane to the policy and programmatic recommendations that might be proposed to deal with underemployment. Finally, distinguishing between the full- and part-time Type II underemployed might prove fruitful.

Conclusions

This study is the first to our knowledge to focus specifically on the underemployment of older workers. Data from the 1979, 1988, and 1993 Current Population Surveys indicate that Type I underemployment has been steadily rising over time. The Type I underemployed are an extremely disadvantaged group in terms of pension and health insurance coverage, suggesting that many of these workers are probably forced to remain in the labor force because of the unaffordability of retirement.

The Type II definition of underemployment among older workers was based on their wages. The standard definition often used in the literature compares worker earnings to 125 percent of the poverty line, but this measure is unsatisfactory because it fails to account for the potentially poor job skills and low productivity of some workers. Type II underemployment is based upon a comparison of workers' wages to "expected" wages, given their demographic and job characteristics. As with the Type I underemployed, we found that workers classified as underemployed by the Type II definition were also disadvantaged.

Nearly 400,000 workers between the ages of 50 and 64 were estimated to be underemployed by the Type I definition. The number underemployed by the Type II definition was much larger, 7.2 million. Approximately 61 percent of the Type I underemployed were also underemployed according to the Type II definition.

The large magnitude of Type II underemployment highlights the need for further work to refine these estimates. The estimated magnitude of Type II underemployment was very sensitive to the wage threshold used. Clearly , as suggested above, additional research is called for. Nevertheless, the fact that the Type II estimates of underemployment were much larger than the Type I estimates, even using the most stringent criteria that were investigated, illustrates that this is too important a dimension of underemployment to be ignored.

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